

Broadband USA

NTIA Grants Program in the Consolidated Appropriations Act of 2021

March 17, 2020

2:00 pm EST

Registration is required for each webinar:

<https://broadbandusa.ntia.doc.gov/event>

Today's Participants

Moderator/ Presenter:

- Karen Perry, Senior Policy Analyst, BroadbandUSA, NTIA, Department of Commerce

Presenters:

- Lai Yi Ohlsen, Project Director, Measurement Labs
- Bryan Darr, Vice President, Smart Communities, Ookla



Helpful Information

Questions

- Please type questions in the Q&A box on the right hand side of the screen. Questions will be taken after the final presenter.

Presentation

- The presentation along with a transcript and recording will be available on the BroadbandUSA website within 7 days of this webinar under Events/past events.
- <https://broadbandusa.ntia.doc.gov/past-event>

Technical Assistance

- Guides, products, publications, and other tools are available to assist you with the planning, funding and implementation of your broadband project.
- <https://broadbandusa.ntia.doc.gov>



Using Data as a Foundation for Broadband Planning

Karen Archer Perry

February 17, 2021

Using Federal Data as a Foundation for Planning

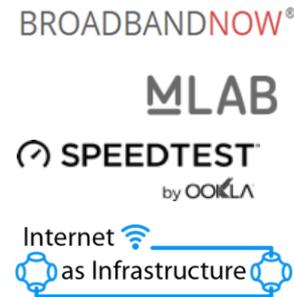
Major federal broadband data sets



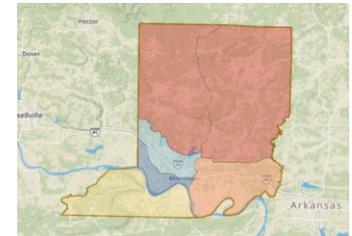
Federal tools to access open data



Third party tools and speed tests



Add local insights



Three Federal Sources for Computer and Internet Data



- ✓ American Community Survey (ACS)
U.S. Census Bureau



- NTIA Internet Use Survey
U.S. Census Bureau Current Population Survey (CPS)



- Form 477 Broadband Deployment and Subscription
Federal Communications Commission (FCC)

American Community Survey - 17 Million Households over 5 years



U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU
census.gov

ACS surveys 3.5M households per year for total of 17M households.
5-year estimates include:

- All 3,142 counties
- Tribal areas
- Populations of 20,000 or less
- Geographic areas down to the tract and block group level

www.census.gov/programs-surveys/acs

Comprehensive Demographic Data



U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU
[census.gov](https://www.census.gov)

No

9 At this house, apartment, or mobile home – do you or any member of this household own or use any of the following types of computers?

	Yes	No
a. Desktop or laptop	<input type="checkbox"/>	<input type="checkbox"/>
b. Smartphone	<input type="checkbox"/>	<input type="checkbox"/>
c. Tablet or other portable wireless computer	<input type="checkbox"/>	<input type="checkbox"/>
d. Some other type of computer Specify <i>z</i>	<input type="checkbox"/>	<input type="checkbox"/>

10 At this house, apartment, or mobile home – do you or any member of this household have access to the Internet?

Yes, by paying a cell phone company or Internet service provider

Yes, without paying a cell phone company or Internet service provider → *SKIP to question 12*

No access to the Internet at this house, apartment, or mobile home → *SKIP to question 12*

11 Do you or any member of this household have access to the Internet using a –

	Yes	No
a. cellular data plan for a smartphone or other mobile device?	<input type="checkbox"/>	<input type="checkbox"/>
b. broadband (high speed) Internet service such as cable, fiber optic, or DSL service installed in this household?	<input type="checkbox"/>	<input type="checkbox"/>
c. satellite Internet service installed in this household?	<input type="checkbox"/>	<input type="checkbox"/>
d. dial-up Internet service installed in this household?	<input type="checkbox"/>	<input type="checkbox"/>
e. some other service? Specify service <i>z</i>	<input type="checkbox"/>	<input type="checkbox"/>

- Subjects:

Age, race and ethnicity, income and poverty, number of children, veteran status, housing type, education level, employment status, industry, commute, and...

Computer ownership, internet subscriptions, cell phone use

- Current Release:

2015-2019 5-year estimates - December 10, 2020

www.census.gov/programs-surveys/acs/methodology/questionnaire-archive.html

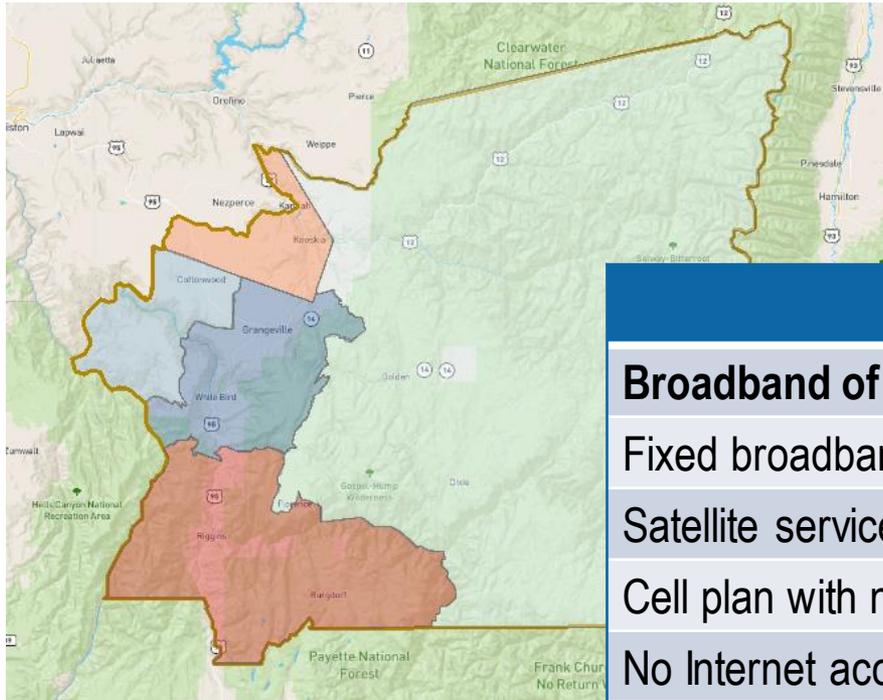
ACS Questions on Internet Subscriptions

- With an Internet Subscription
 - With Broadband of any type
 - Wireline as cable, fiber optic or DSL
 - Cellular data plan
 - Cellular data plan only
 - Satellite Internet service
 - Other Service
 - Dial-up only
- Without an Internet subscription
 - Have Access but no subscription
 - No Internet Access



data.census.gov

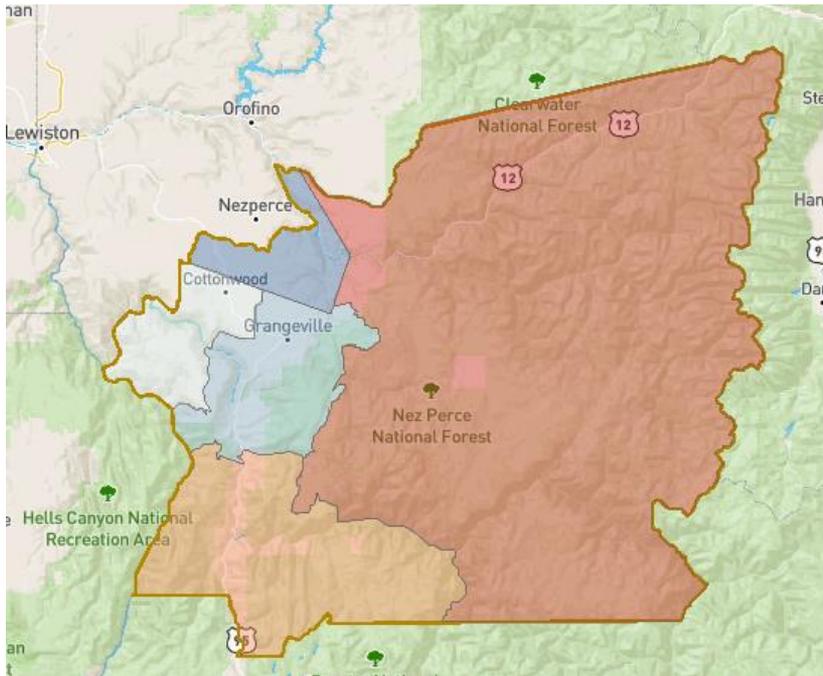
Internet Subscription in Idaho County, ID



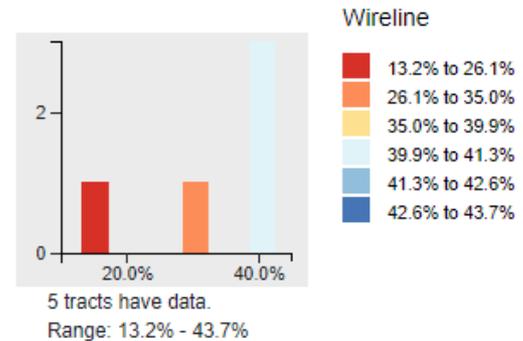
	Idaho County	USA
Broadband of any type	69.4% +/- 3.2%	82.7%
Fixed broadband	37.1% +/- 3.0%	68.9%
Satellite service	29.3% +/- 3.0%	6.3%
Cell plan with no other data	7.1% +/- 1.9%	10.0%
No Internet access	25.1% +/- 3.6%	13.9%

ACS Internet Subscription Rates; Map courtesy of I3 Connectivity Explorer©

Fixed Broadband Subscription in Idaho County, ID



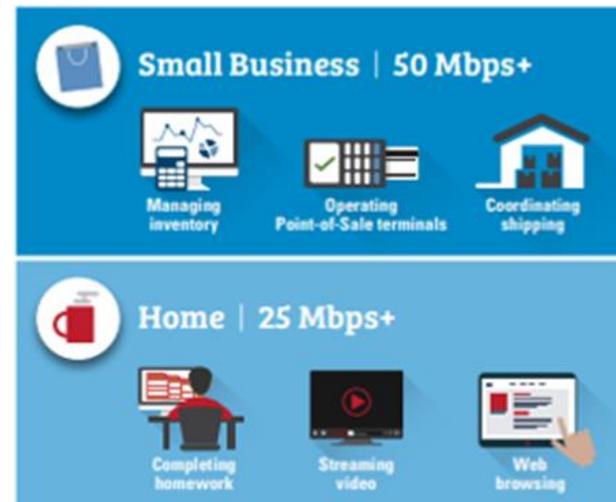
Census Tract Range
13.2% to 43.7%
 County median 37.1% +/- 3.0%



ACS Internet Subscription Rates; Map courtesy of I3 Connectivity Explorer©

ACS Questions on Device Ownership

- Households with one or more computing devices
 - Desktop or laptop
 - Desktop or laptop and no other computing device
 - Smartphone
 - Smartphone with no other computing device
 - Tablet
 - Tablet with no other computing device
 - Other computer
 - Other computer with no other computing device
- Without a computer



data.census.gov

Digital Divides in Idaho County (pop 16,411)

Homework Gap (under 18)

- 12.2% of children under 18 have no computer and no Internet
- 7.8% of children under 18 have a computer but no Internet

Workforce Gap (ages 18-64)

- 11.5% of adults have no computer and no Internet
- 24.8% of adults have a computer but no Internet

Healthcare and Family Connections Gap (ages 65 plus)

- 8.1% of seniors have no computer and no Internet
- 2.2% of seniors have a computer but no Internet

American Community Survey 2015-2019 Computer and Internet Subscription



Digital Gaps

1600 gap
for children



1600 gap
for adults



600 gap
for seniors

Putting the Data in Your Hands! Tools



NTIA Data Explorer

ntia.doc.gov/data



American Community Survey

data.census.gov

QuickFacts

census.gov/quickfacts



Broadband, Equity, COVID-19*

coronavirus-resources.esri.com

BROADBANDNOW®

BroadbandNow*

broadbandnow.com



Speedtest by Ookla*

speedtest.net

MLAB

Measurement Lab*

speed.measurementlab.net



I3 Connectivity Explorer*

i3connect.org

**These are not federal tools. They are external tools or products, listed here because they are used frequently by our clients to access data when developing broadband plans.*

QuickFacts



- People
 - Population
 - Age and Sex
 - Race and Hispanic Origin
 - Population Characteristics
 - Housing
 - Families and Living Arrangements
 - Computer and Internet Use
 - Education
 - Health
 - Economy
 - Transportation
 - Income and Poverty
- Businesses
- Geography
- [QuickFacts](#)

<https://www.census.gov/quickfacts/fact/>

QuickFacts
Idaho County, Idaho; United States

QuickFacts provides statistics for all states and counties, and for cities and towns with a *population of 5,000*

-- Select a fact --

Dashboard - Idaho County, Idaho

Population esti	
<div style="border: 1px solid #ccc; padding: 2px;">All Topics</div>	<div style="border: 1px solid #ccc; padding: 2px;">Idaho County, Idaho</div>
i Population estimates, July 1, 2019, (V2019)	16,667
i PEOPLE	
Population	
i Population estimates, July 1, 2019, (V2019)	16,667
i Population estimates base, April 1, 2010, (V2019)	16,267
i Population, percent change - April 1, 2010 (estimates base) to July 1, 2019, (V2019)	2.5%
i Population, Census, April 1, 2010	16,267
Age and Sex	

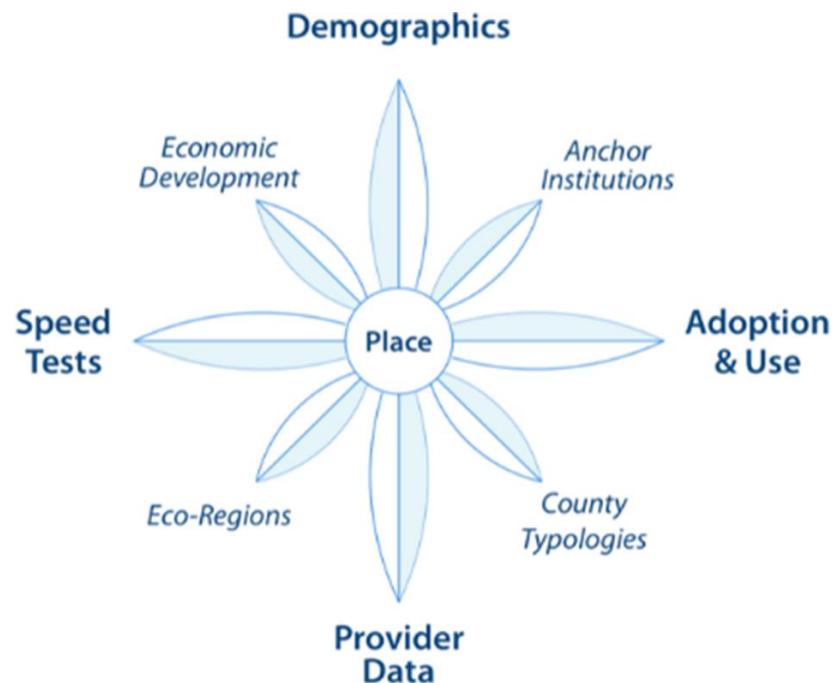
- Recovery Metrics – Updated Weekly!
- [Household Pulse Survey Dashboard](#)

I3 Connectivity Explorer – A place-based view



Views broadband connectivity data broadly through the lens of the places we live:

- Towns
- Counties
- County subdivisions
- Tribal regions
- School Districts
- Congressional Districts
- States



i3connect.org <https://community.internet-is-infrastructure.org/>

Contact BroadbandUSA

Submit Technical Assistance form:

<https://broadbandusa.ntia.doc.gov/ntia-common-content/how-we-can-help>

Contact:

KPerry@ntia.gov or 202-697-2104



Speed Simulator Charts

Visitor can select his requirement option and show data speeds on speed simulators total time.

10 Point-of-Sale Terminals (Restaurant) - 10 MB	20 customers on WiFi - 50 MB	Data Files (ex. Website design) - 100 MB	
Video Chat (multi-user) - 4 MB	Remote Classroom/Homework Streaming - 5 MB	eTextbook - 10 MB	8K Video Streaming - 80 MB
4K Video Streaming - 18 MB	Streaming Dr. Consultation - 18 MB	Medical Records - 39 MB	
Research: Big Data Health Sets (e.g., Neuroimaging annually) - 1073749240 MB	Patient MRI (not 3D) - 30 MB		

Website: <https://broadbandusa.ntia.doc.gov/>

Email: broadbandusa@ntia.doc.gov

Phone: 202-482-2048

Lai Yi Ohlsen, Project Director, Measurement Labs



Measurement Lab
@measurementlab

Lai Yi Ohlsen

laiyi@measurementlab.net



Mission



M-Lab's mission is to measure the Internet, save the data and make it universally accessible and useful.

Motivation



M-Lab's mission is to measure the Internet, save the data and make it universally accessible and useful.

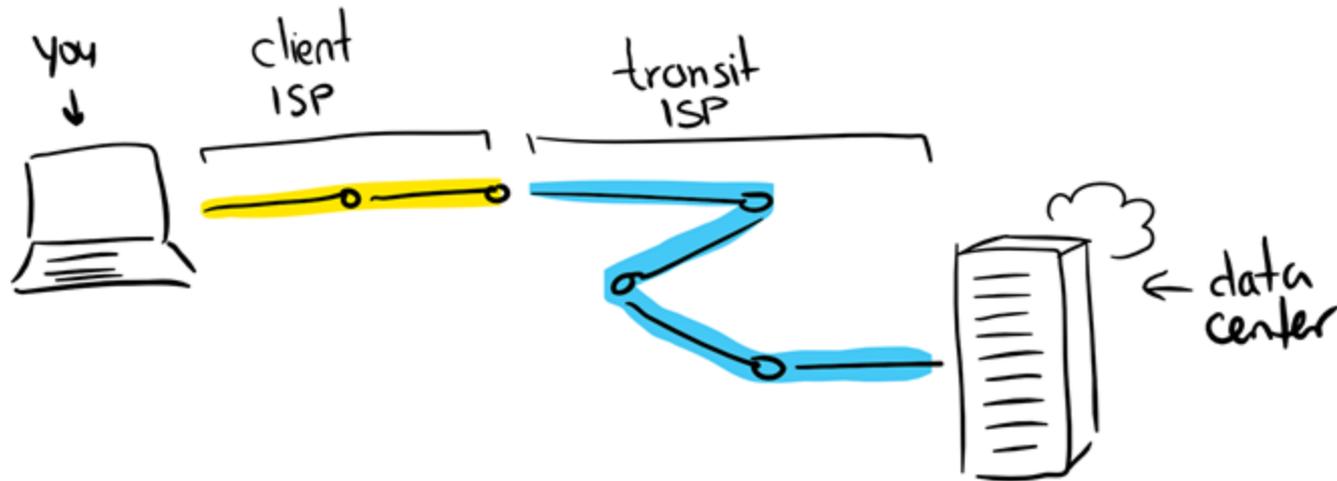
We do this because we want to support a healthy Internet and we know a healthy Internet can be taken for granted.

How we measure the Internet

MLAB

@ **CS&S** Code for
Science &
Society

We run an off-net platform of 500+ servers in 130+ metros.



How we measure the Internet

MLAB

@ **CS&S** Code for
Science &
Society

NDT reports the upload, download, and latency metrics of a connection's "single-stream bulk transport capacity", a standard defined by the IETF and provides an effective baseline for a user's performance.

Results

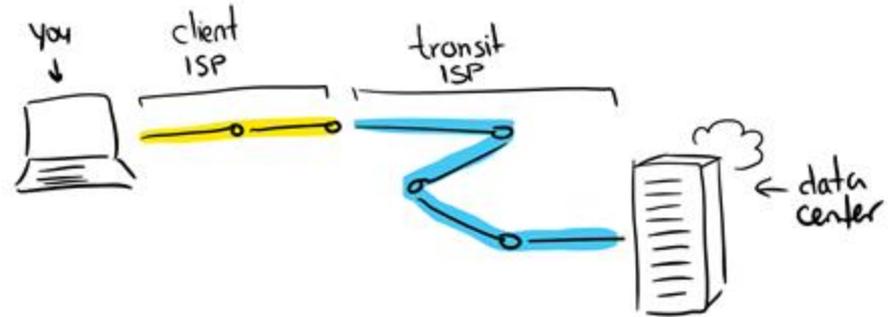
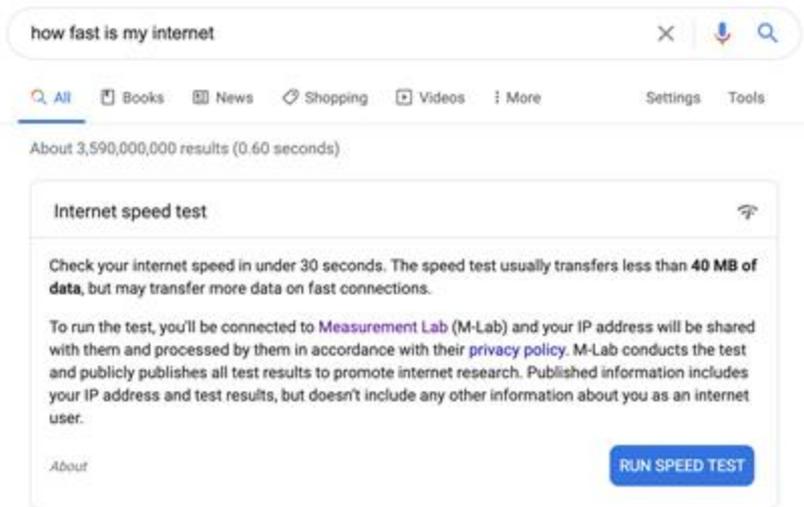
	Test Server	New York, US
	Download	64.88 Mb/s
	Upload	19.98 Mb/s
	Latency	16 ms
	Retransmission	0.26%

How we measure the Internet

MLAB

@ **CS&S** Code for Science & Society

Data is generated by users using client applications to run tests against M-Lab servers.

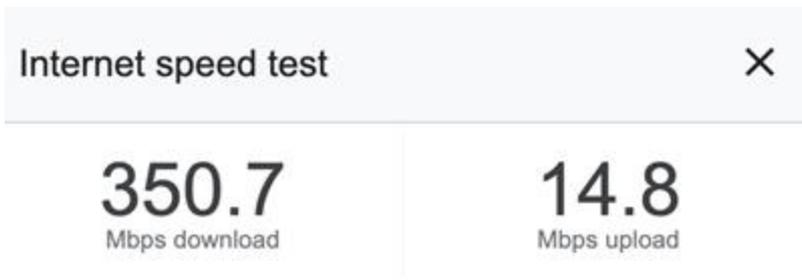


Data

MLAB

@ **CS&S** Code for Science & Society

When a user runs a test, they are shown their results and the results are then publicly archived in our free and open database.



Internet speed test ×

350.7 Mbps download	14.8 Mbps upload
-------------------------------	----------------------------

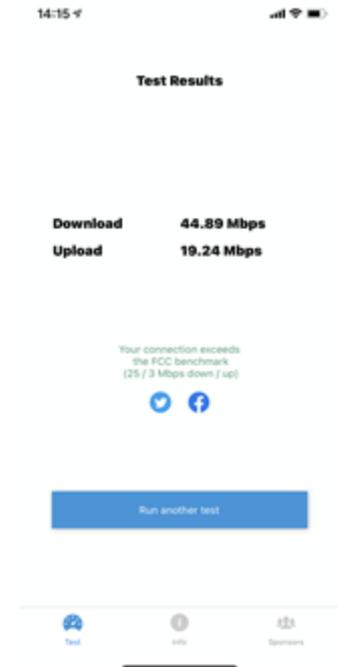
Latency: 12 ms
Server: New York

Your Internet connection is very fast.

Thank you!

Download Speed: 100.08 Mb/s
Upload Speed: 14.31 Mb/s
Latency: 14 ms

Thank you for taking the survey!



14:15 📶

Test Results

Download	44.89 Mbps
Upload	19.24 Mbps

Your connection exceeds the FCC benchmark (25 / 3 Mbps down / up)

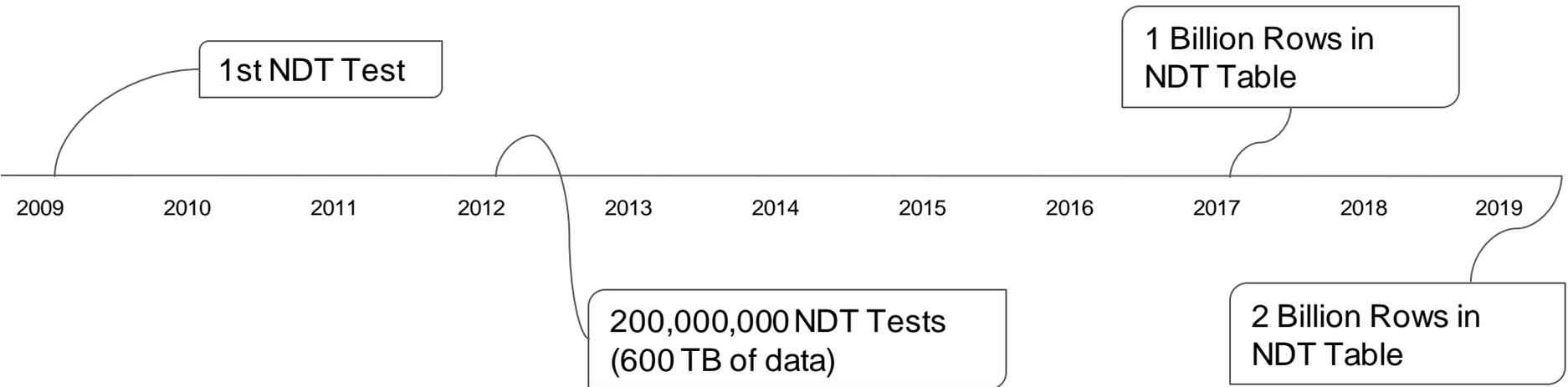
[🐦](#) [f](#)

[Run another test](#)

[Test](#) [Info](#) [Support](#)

Data

As of 2021, we have over 2 billion rows of NDT data.

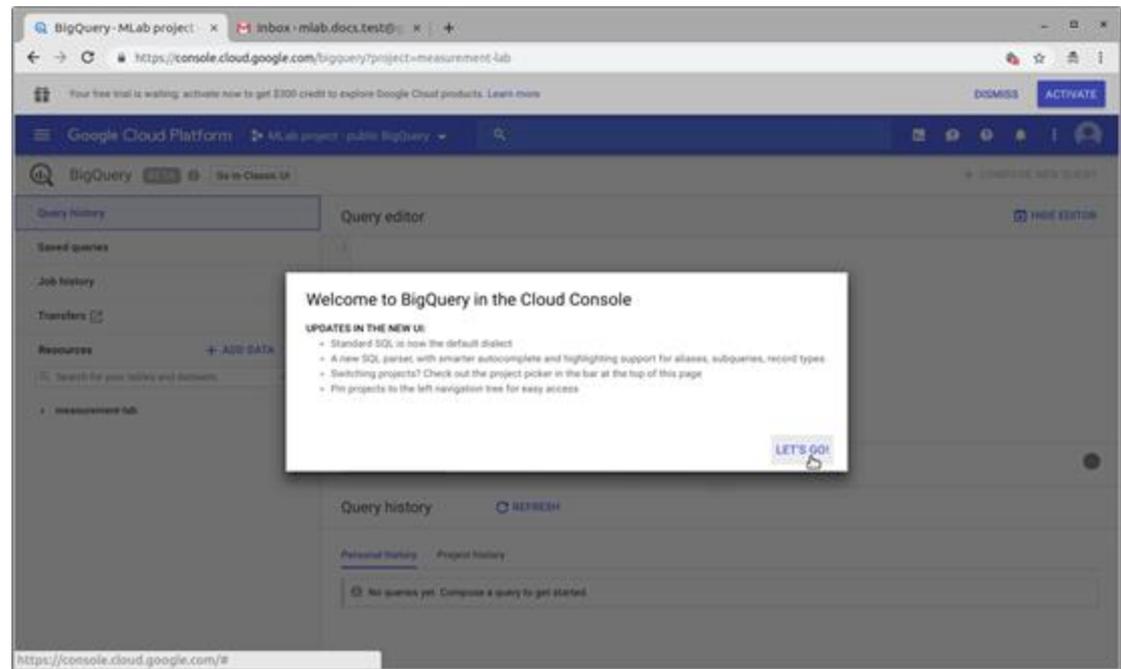


Data

All data is publicly archived and accessible for free using BigQuery.

MLAB

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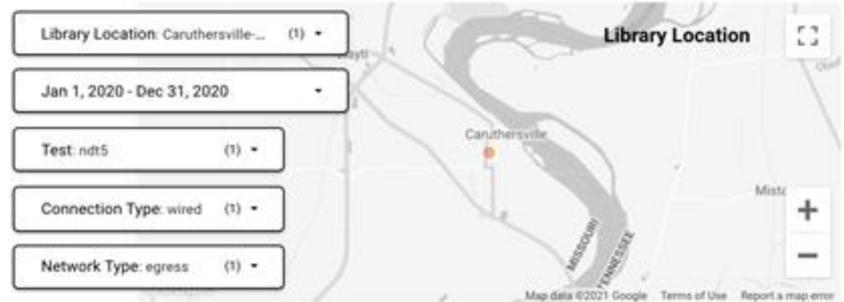


Data

The data can be visualized using tools such as DataStudio.

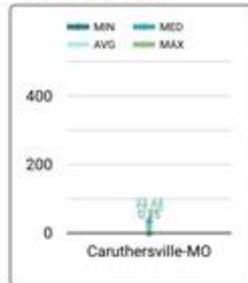
MLAB

@ CS&S Code for Science & Society

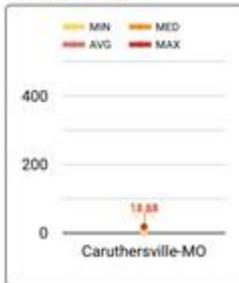


Overall Statistics

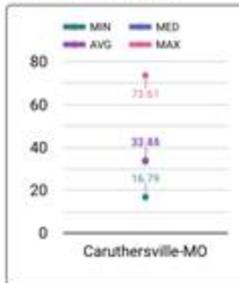
Download (Mbps)



Upload (Mbps)



Min RTT / Ping (ms)



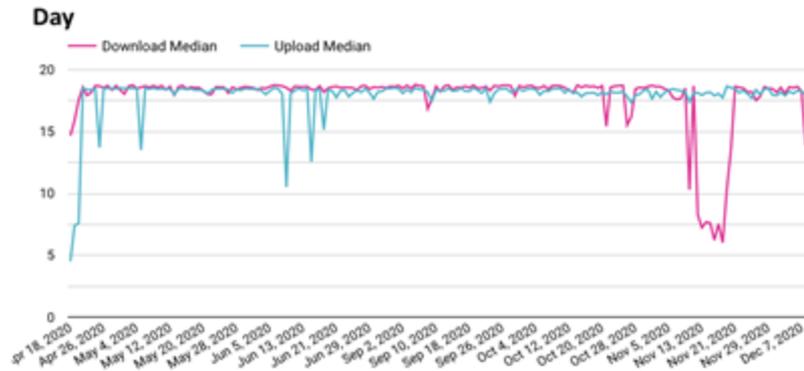
Test Server Locations



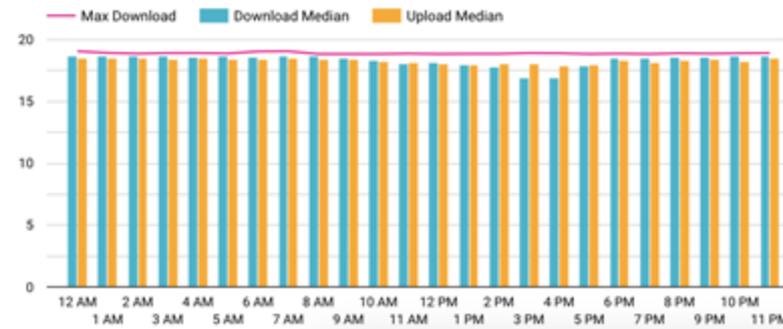
Data

The data can be visualized using tools such as DataStudio.

Measurements By:



Hour



MLAB

@ CS&S Code for Science & Society



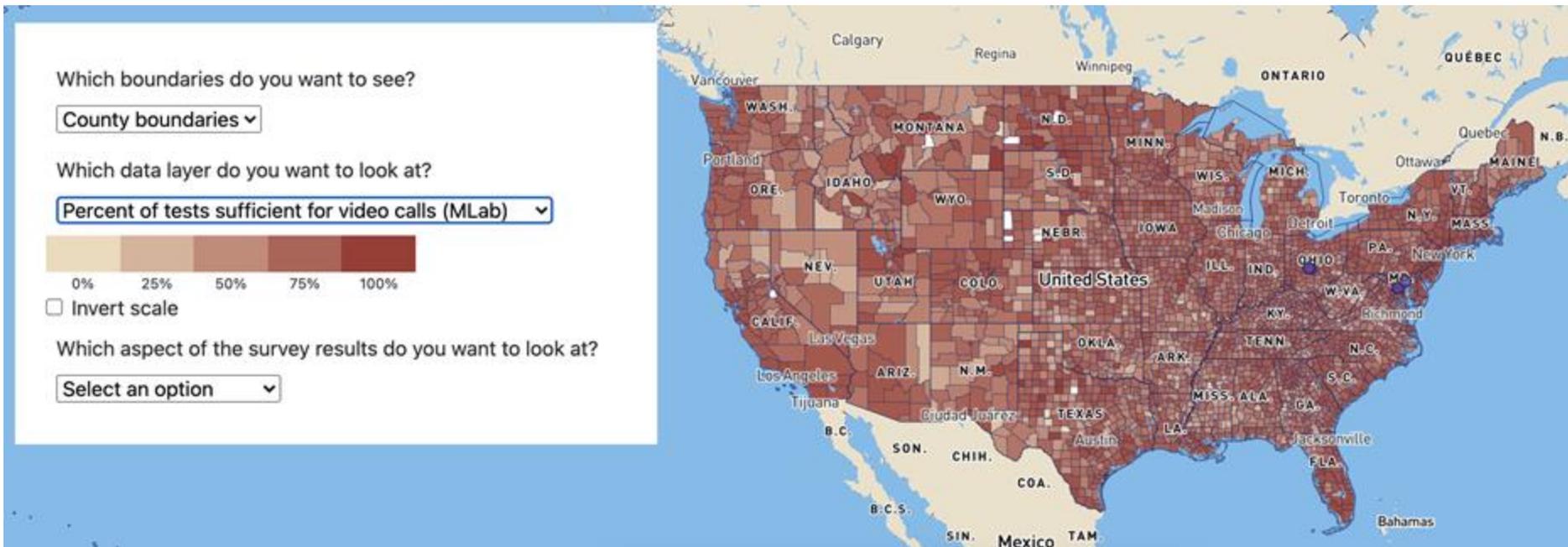
Test	Server Network/Host	Location
ndt5	Level 3 Parent, LLC	Chicago, US
ndt5	GTT Communications Inc.	Chicago, US
ndt5	TATA COMMUNICATIONS (AMERICA) INC	Atlanta, US
ndt5	GTT Communications Inc.	Atlanta, US
ndt5	Telia Company AB	Atlanta, US
ndt5	Cogent Communications	Atlanta, US
ndt5	Level 3 Parent, LLC	Atlanta, US
ndt5	Cogent Communications	Chicago, US
ndt5	Zayo Bandwidth	Chicago, US
ndt5	TATA COMMUNICATIONS (AMERICA) INC	Chicago, US

1 - 10 / 10 < >

Data

MLAB

@ CS&S Code for Science & Society



Local data collection

All M-Lab code is open source. NDT can be integrated into any website or you can use an existing integration such as TestIT, SpeedUp America or Piecewise.

Good for: public engagement and citizen science campaigns.



MLAB

@ CS&S Code for Science & Society

The Marconi Society

Piecewise

Welcome to Piecewise!

Sharing your location

To get the most accurate location data, we ask you to allow your browser to share your location. This is not essential but it is very helpful for creating more accurate maps. Depending on your browser, you'll see a window similar to the images below, requesting your consent to share your location. If you are using Private Browsing mode or Incognito mode, you may need to disable that preference for this website.



Automatic, recurring measurements

Automatic, recurring measurement can help eliminate issues of self-selection bias and require minimal human intervention.

Good for: feasibility studies and community anchor institutions.



MLAB

@ CS&S Code for Science & Society



chrome web store

Home > Extensions > M-Lab Measure



M-Lab Measure

Offered by: Measurement Lab

★★★★★ 12 | Social & Communication | 1,000+ users

Mission



M-Lab's mission is to measure the Internet, save the data and make it universally accessible and useful.

Questions? support@measurementlab.net

Measurement Lab
@measurementlab

Lai Yi Ohlsen

laiyi@measurementlab.net



Bryan Darr, Vice President, Smart Communities, Ookla





Using Data as a Foundation for Broadband Planning

February 17, 2021

Bryan Darr, Vice President of Smart Communities, Ookla
bryan.darr@ookla.com

Ookla®

The global leader in mobile and broadband network intelligence, testing applications and technology. Internet service providers, mobile network operators, businesses and government agencies alike rely on Ookla for unparalleled and immediate information on the state of networks and online services.

Trusted by the Public

- Hundreds of millions of users
- 10+ million tests taken every day (**34+ billion** tests to date)
- Anonymized data ensures privacy and GDPR compliance
- Clients include every major telecom provider in the United States

Speedtest has the most ...



Users



Tests



Data



Insight

SPEEDTEST®





2020 Speedtest Stats for the United States

293 million
tests combined on
fixed & wireless networks

taken on

58 million
unique devices

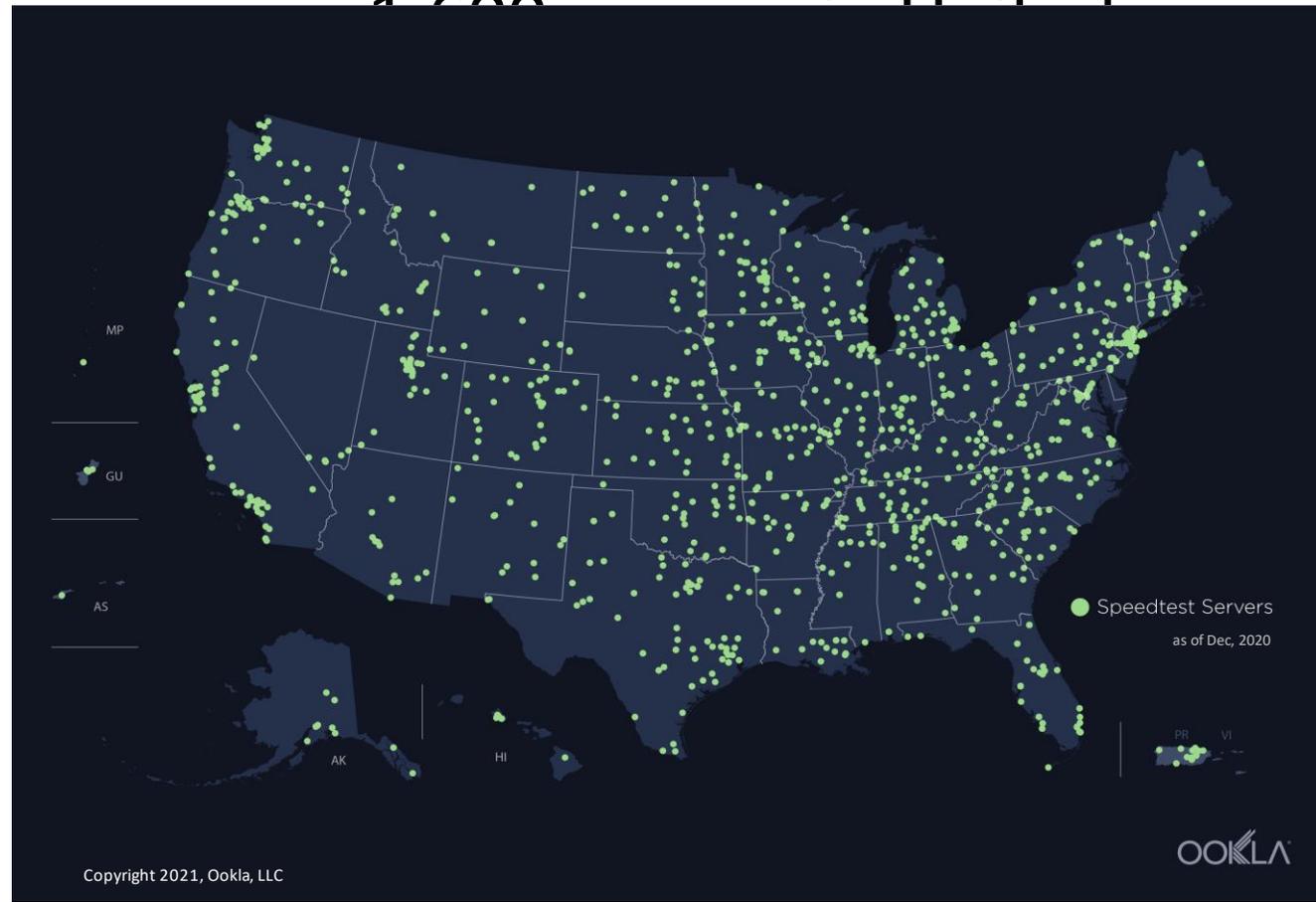


Key Stat

includes **154 million**
tests with GPS precision location

Speedtest Server Network™ has

1,600+ servers in the United States



Speedtest Intelligence®

Why do states need to supplement their data collection efforts?

- Lack of historical data
- Participation will decrease without constant engagement
- Search engine results and app stores will not present your test near top of 1st page
- **Need for greater volume!** Speedtest® is collecting an average of **60x more** tests



Examples of Local Collection Efforts



As of Jan 29, 2021	Maine	Minnesota	Washington	Wyoming
Announced launch date	Nov 24, 2020	Aug 3, 2020	Jul 30, 2020	Jul 18, 2019
Test count since launch	14,478	47,716	33,054†	2,754*
Weeks operational	9.5	25.5	26	79
Local Efforts Average per week	1,524	1,871	1,271	35
2020 Speedtest™ measurements	1,124,573	5,071,852	8,345,312	445,476
Ookla Average per week	21,626	97,536	160,486	8,567

†Test count as of 2/3/12

*Test count has not recently changed

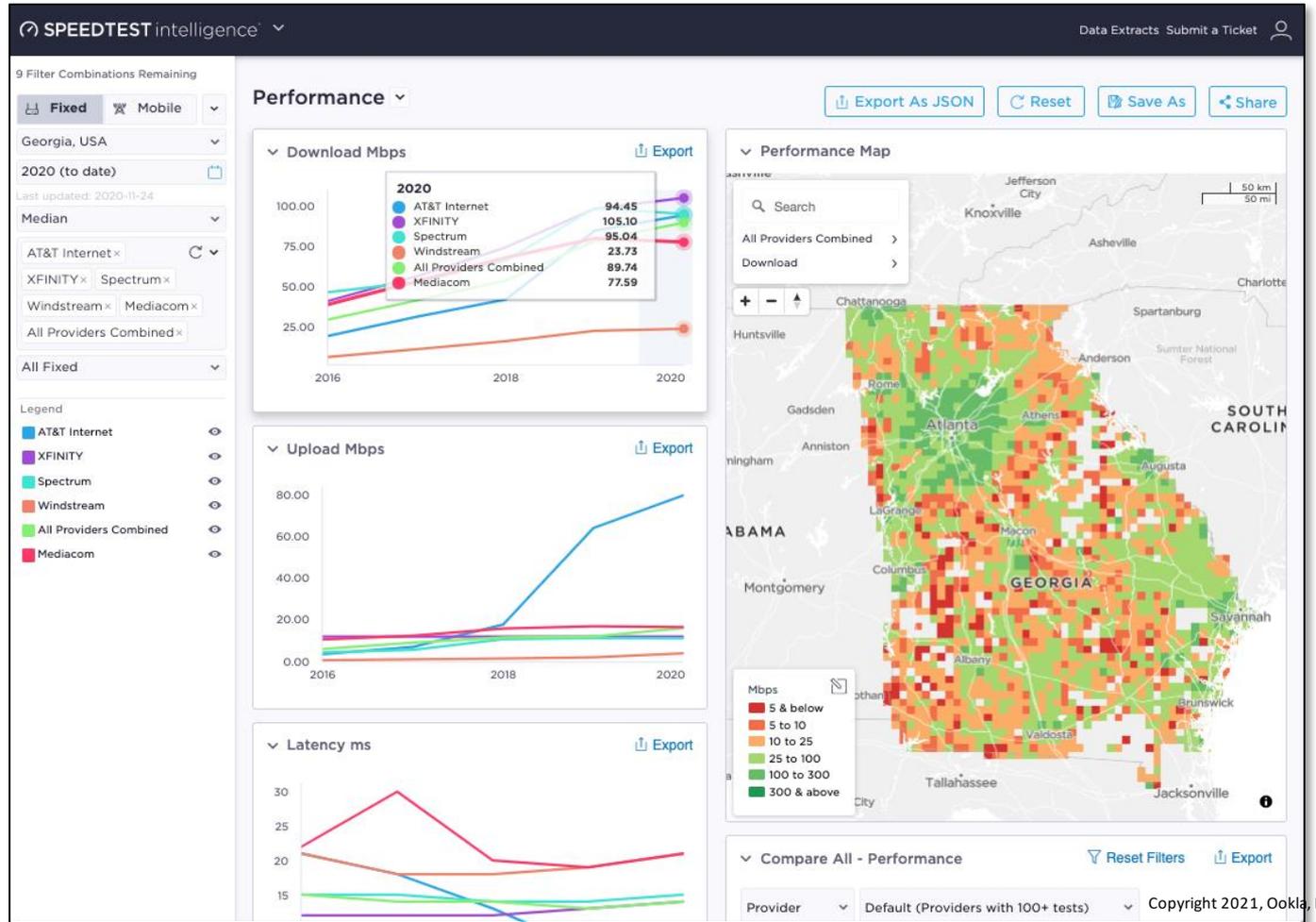
Speedtest Intelligence® Portal

Example:

Georgia

All Fixed Operators

Jan – Nov 2020



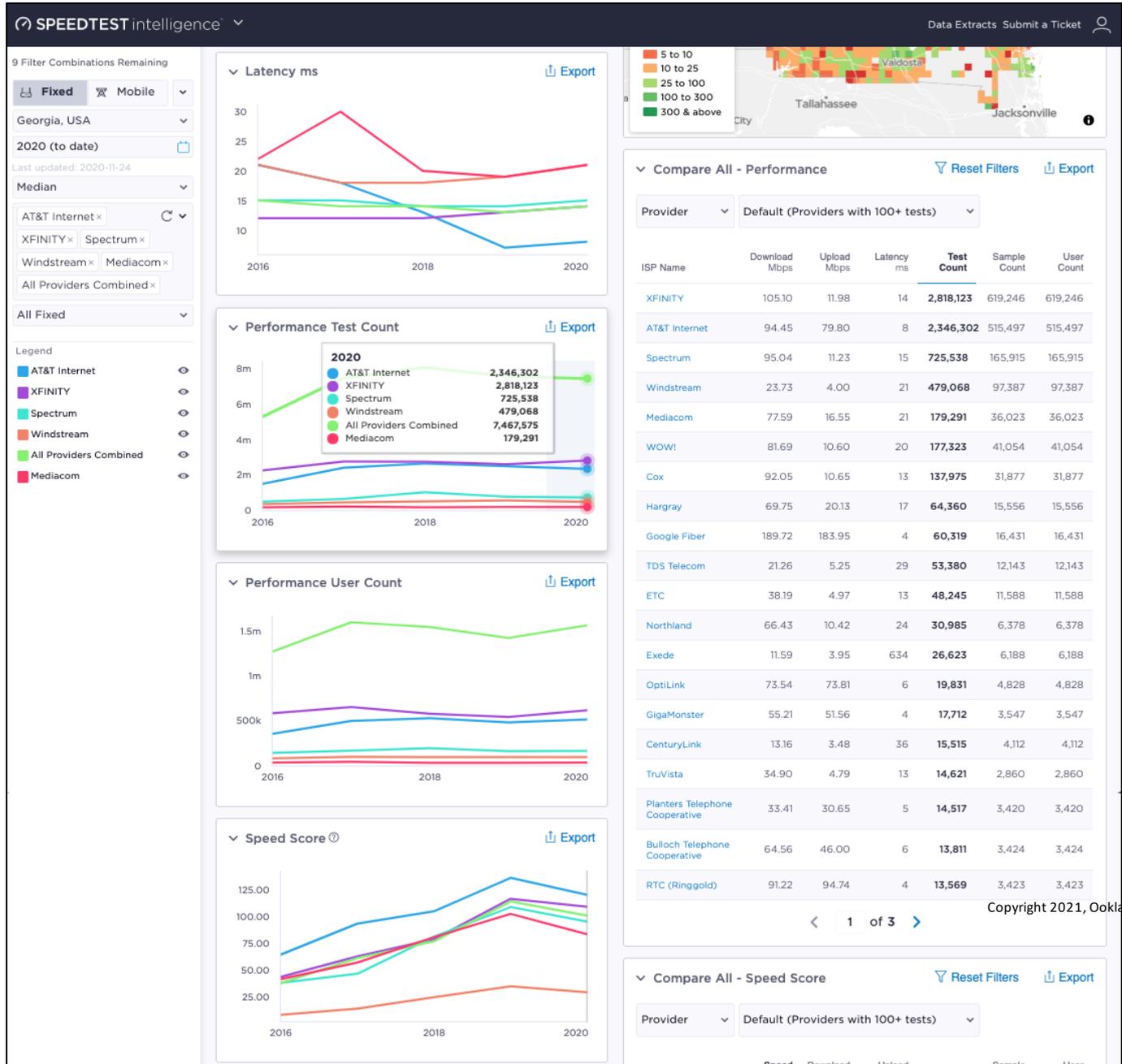
Speedtest Intelligence® Portal

Example:

Georgia

All Fixed Operators

Jan – Nov 2020

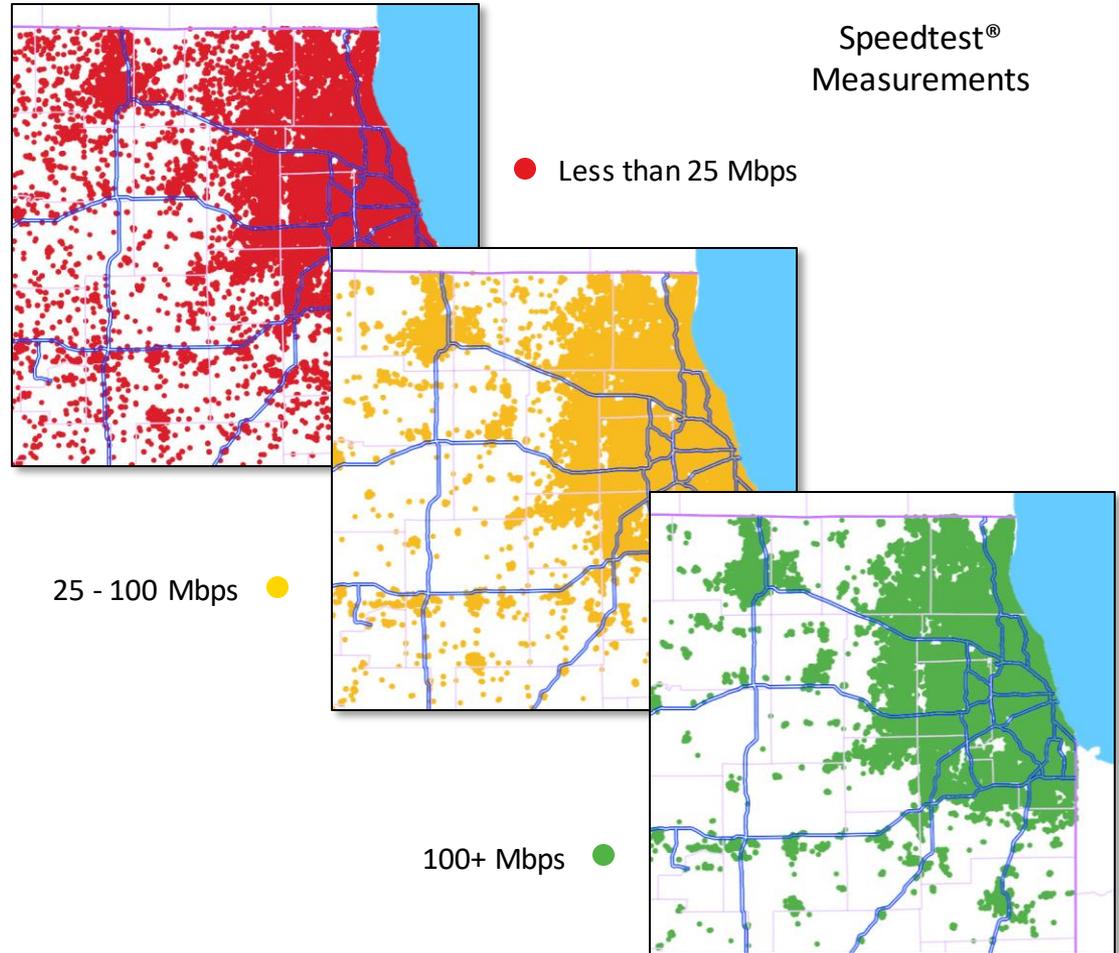


Example:
Northeast Illinois
Nov 2019 – Jan 2020

Consumer-Initiated Fixed Network Performance

- Fixed operators tested via Android and iOS devices
- Filtered for records with GPS-provided longitude and latitude

Speedtest®
Measurements



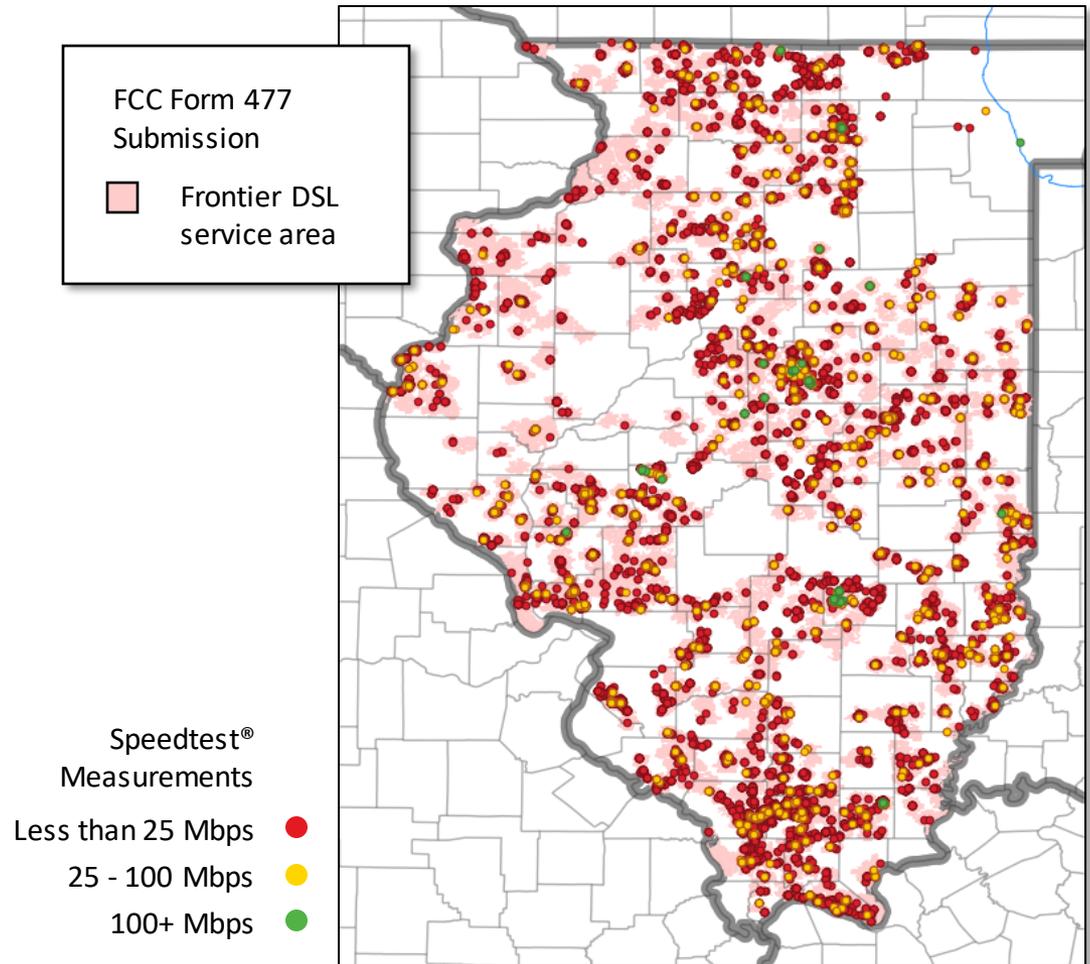
Example:

Northeast Illinois

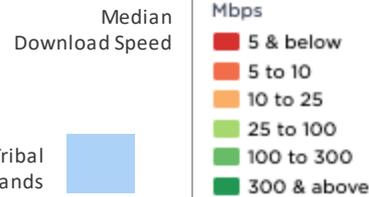
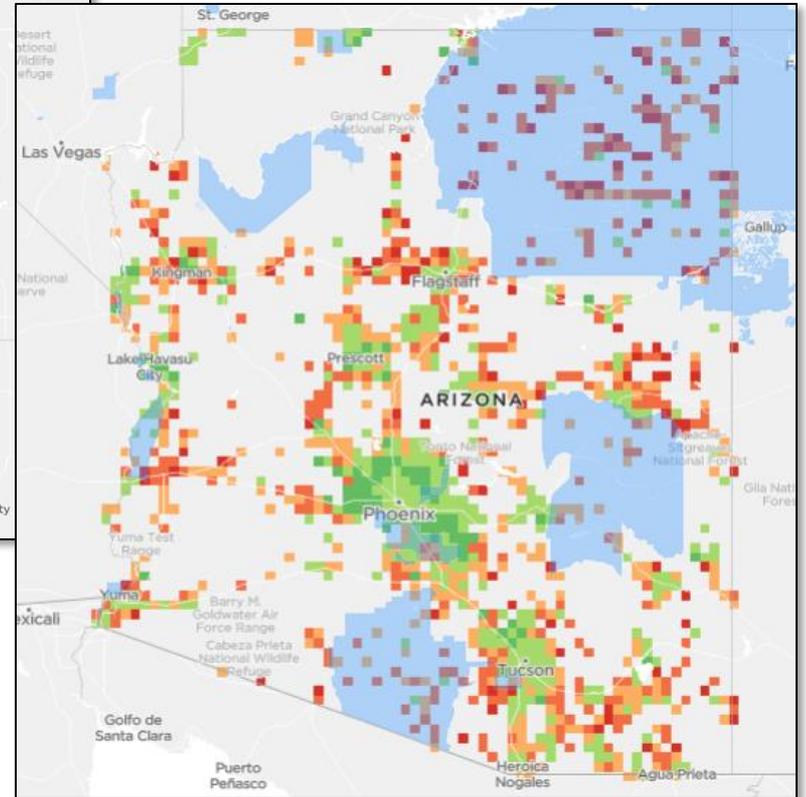
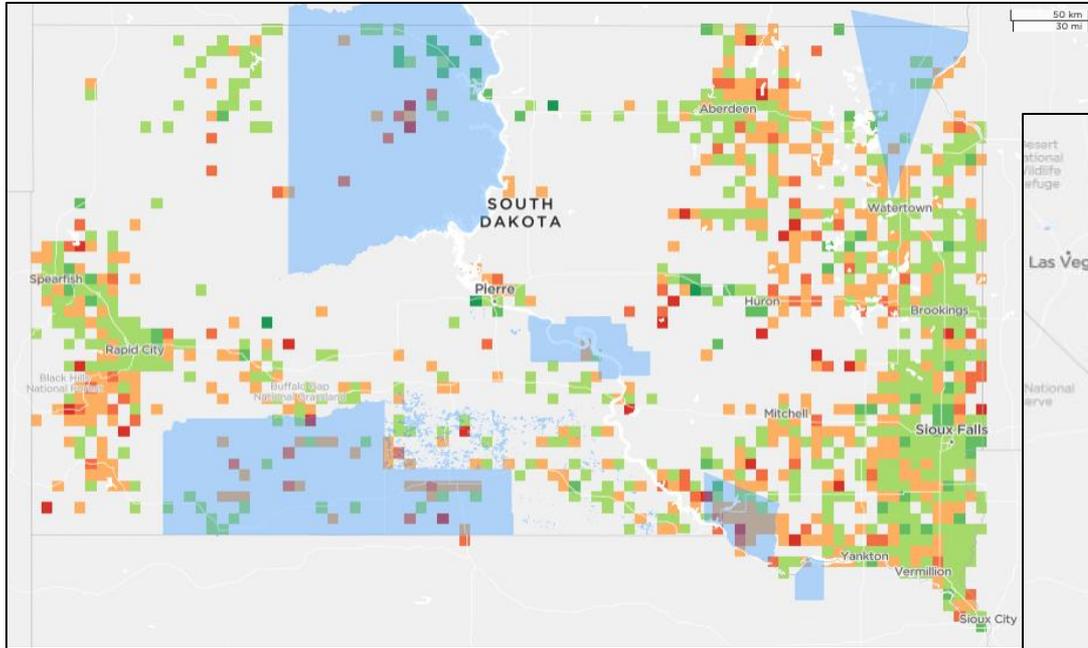
Nov 2019 – Jan 2020

Consumer-Initiated Fixed Network Performance

- Fixed operators tested via Android and iOS devices
- Filtered for records with GPS-provided longitude and latitude
- Compare test results to each ISP's Form 477 footprints



2020 Tribal Lands Broadband Performance



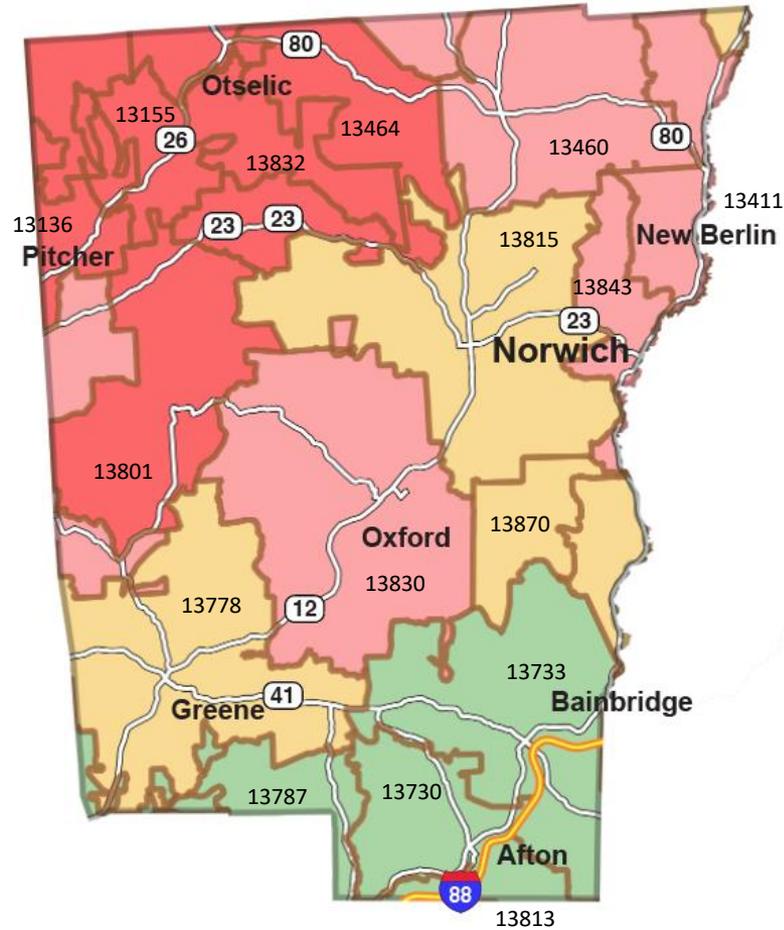
Speedtest
Intelligence®

Consumer-Initiated
Fixed Network
Performance

Example:

Chenango County, NY

All Operators
Jan – Jun 2020



Download Speeds

Median Speeds
by Zip Code

- Less than 10 Mbps
- 10 - 25 Mbps
- 25 - 50 Mbps
- 50+ Mbps

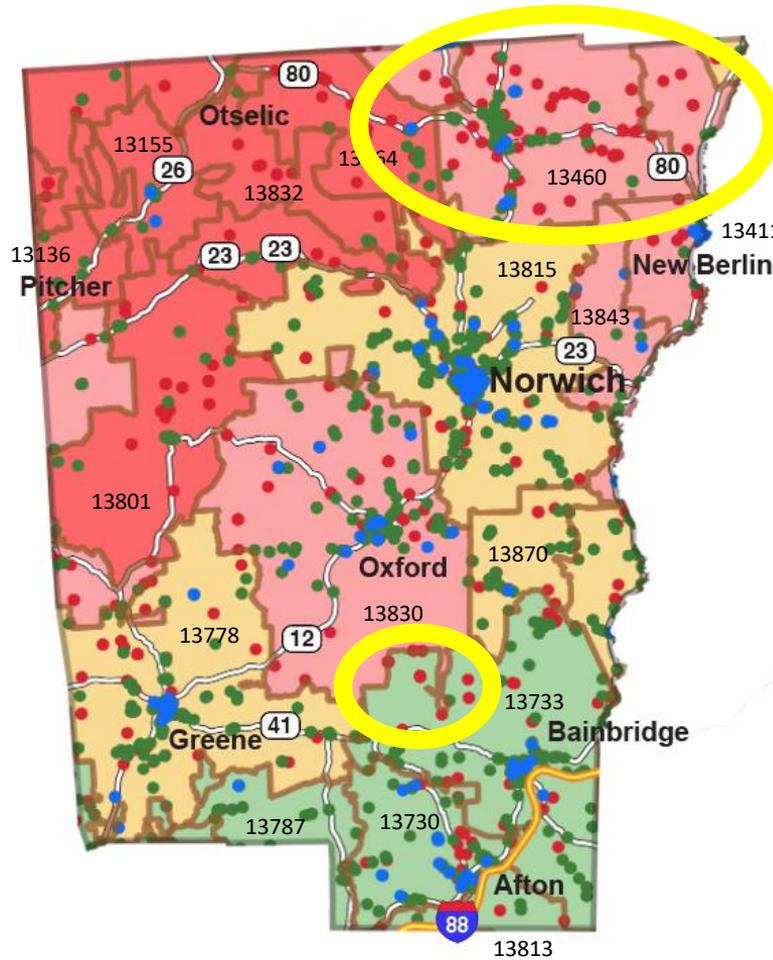
Speedtest
Intelligence®

Consumer-Initiated
Fixed Network
Performance

Example:

Chenango County, NY

All Operators
Jan – Jun 2020



Download Speeds

Median Speeds
by Zip Code

- Less than 10 Mbps
- 10 - 25 Mbps
- 25 - 50 Mbps
- 50+ Mbps

Speedtest®
Measurements

- Less than 25 Mbps
- 25 - 300 Mbps
- 300+ Mbps

Example:

Idaho County, ID

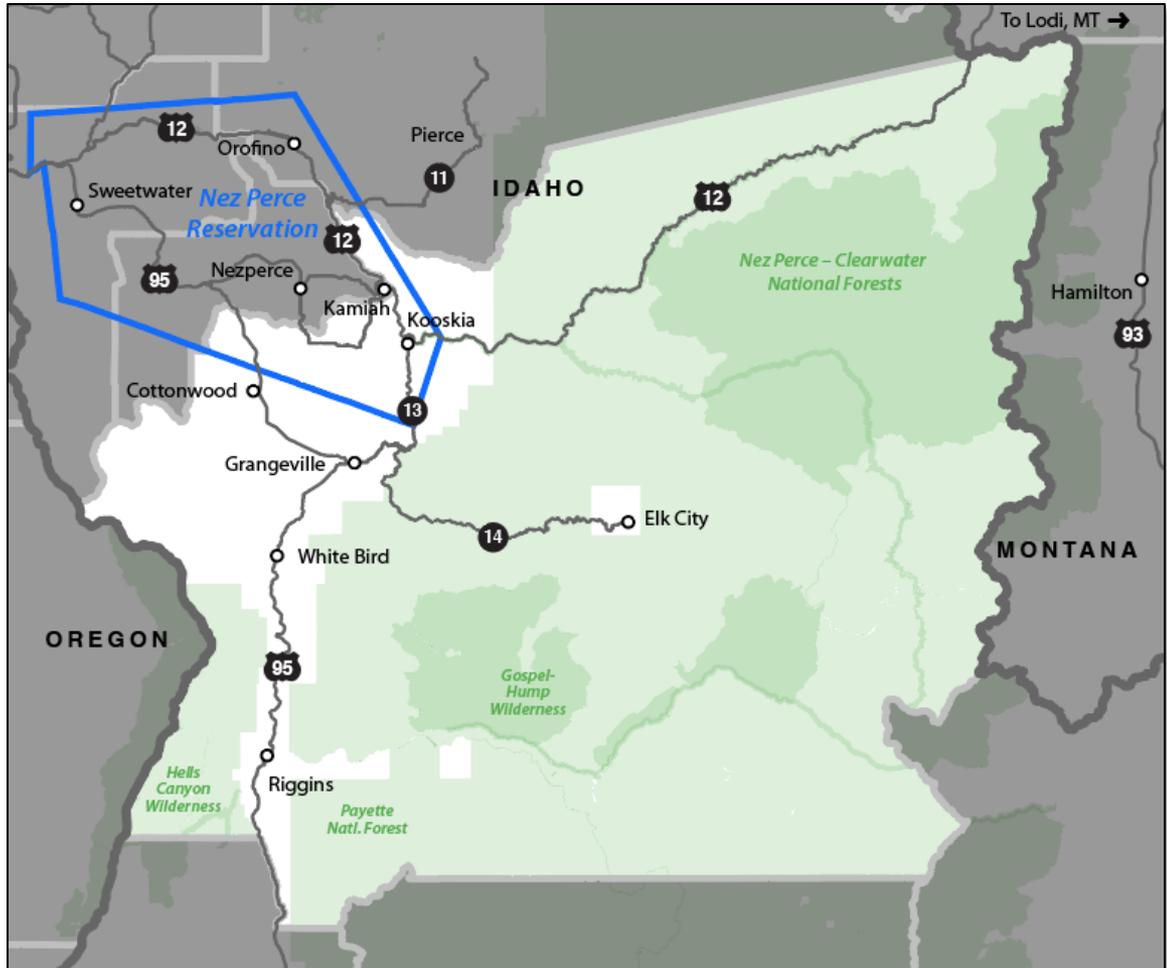
Year 2020

- Identify where people are and where they are not

National Forest or Wilderness area



Tribal Lands



Example:
Idaho County, ID

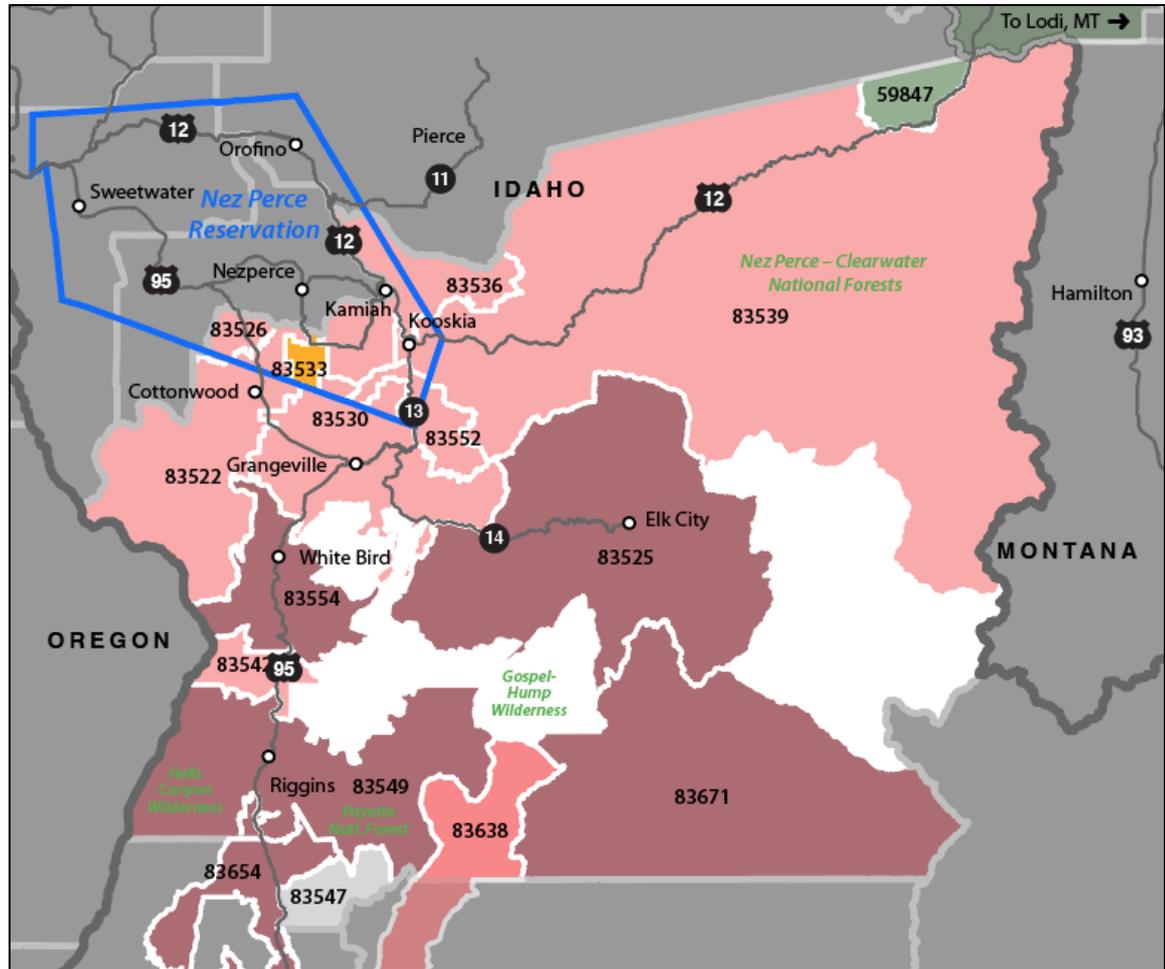
Year 2020

- Identify where people are and where they are not
- Zip codes can represent extremely large areas

Median Speeds
by Zip Code



Tribal
Lands



Example:
Idaho County, ID

Year 2020

- Identify where people are and where they are not
- Zip codes can represent extremely large areas
- Pinpointing communities in need helps prioritize funding
- Tribal lands offer additional funding opportunities

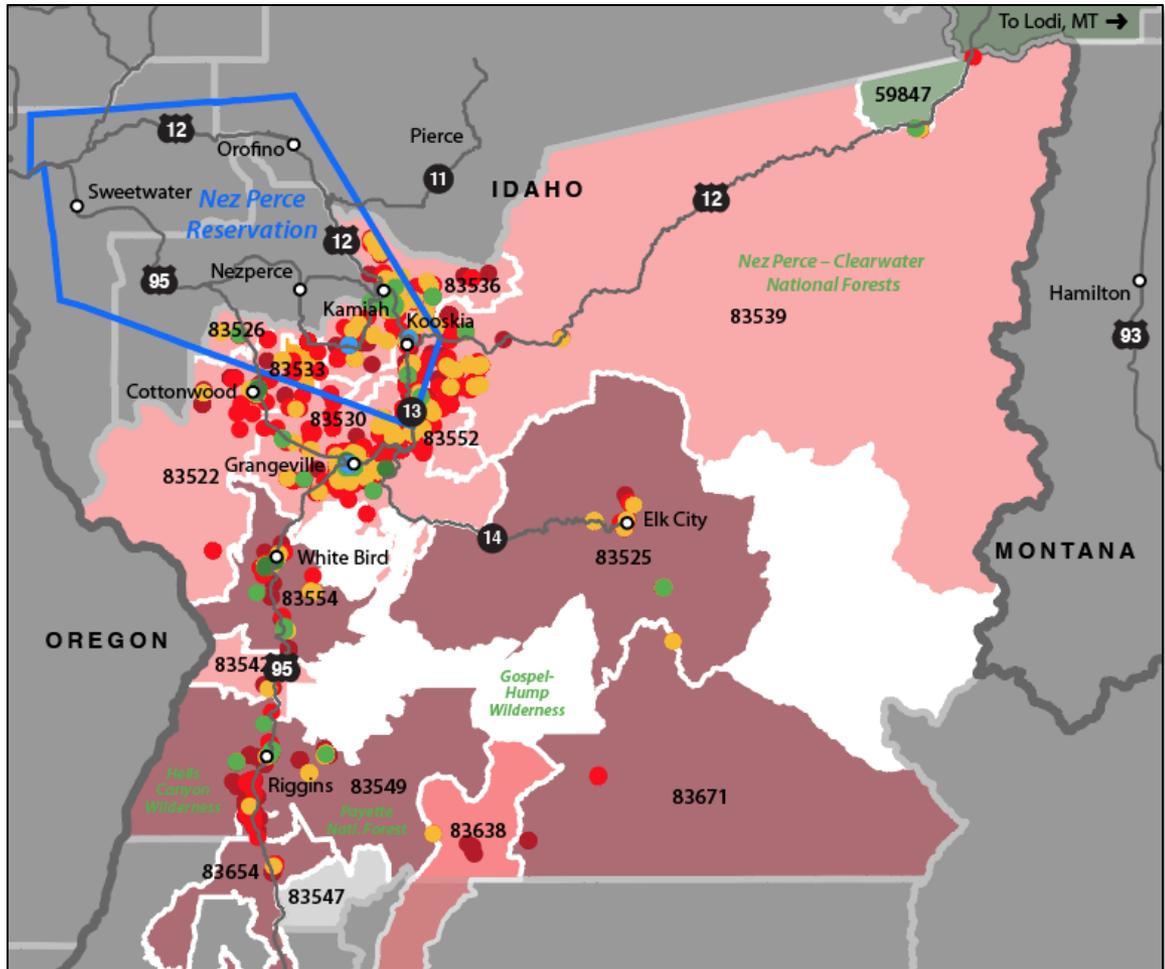
Speedtest®
Measurements

- < 10 Mbps ●
- 10 - 25 Mbps ●
- 25 - 50 Mbps ●
- 50 - 100 Mbps ●
- 100 - 300 Mbps ●
- 300+ Mbps ●

Median Speeds
by Zip Code

- < 10 Mbps
- 10 - 25 Mbps
- 25 - 50 Mbps
- 50+ Mbps
- No Zip Code assigned

Tribal Lands



Better Data Means Better Decisions

- A small investment in better data can inform better decisions
- Target areas where broadband is needed most
- Avoid over-building and harming existing businesses
- Analyze using your demographics — do the most good, for the most people
- Prioritize fiber in the Right-of-Way



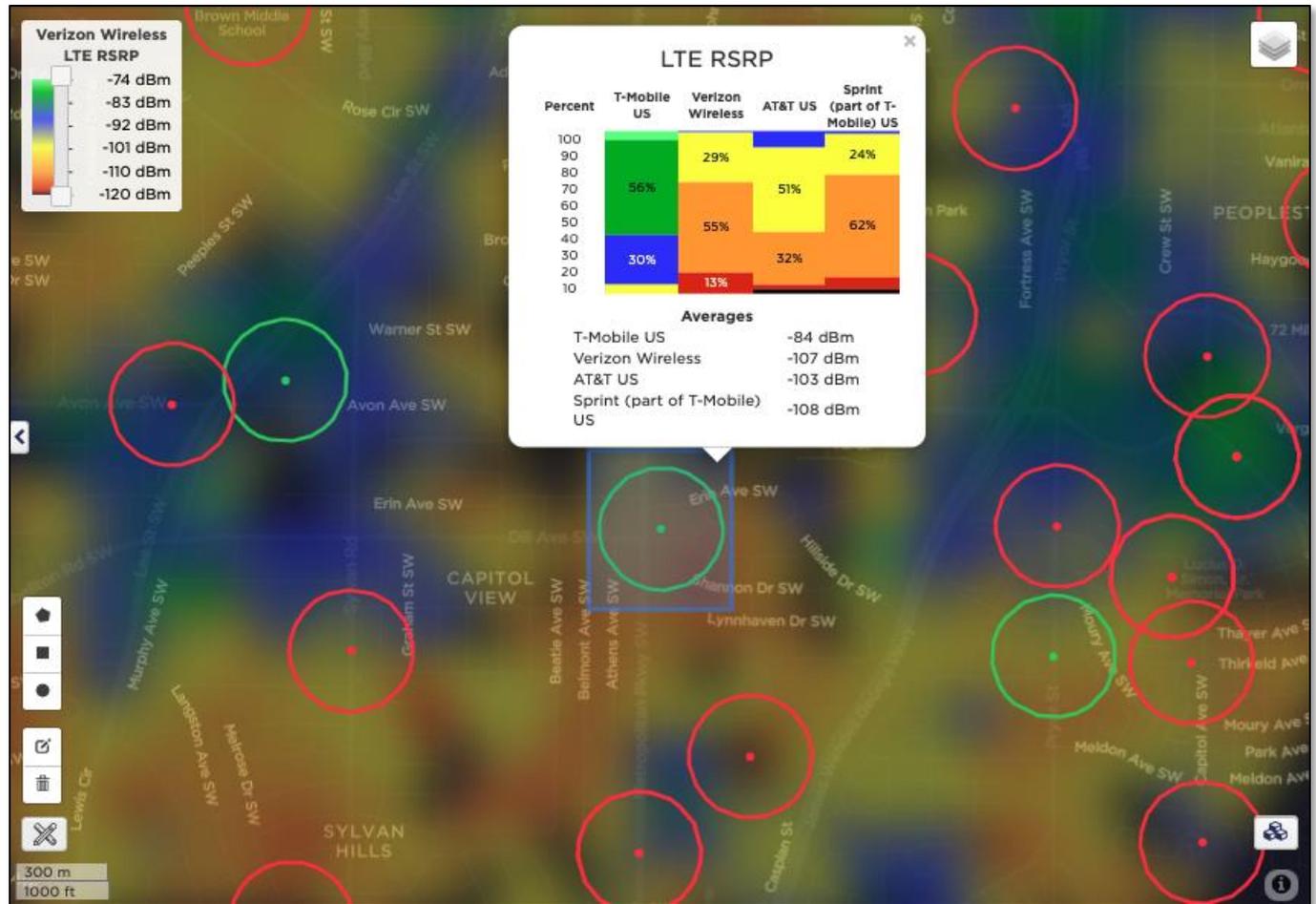
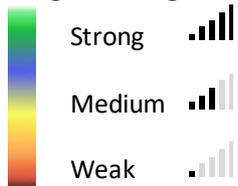
Cell Analytics™

Solving for where Wi-Fi/LTE hotspots will work

Schools 

Libraries 

Signal Strength



TowerSource™

Wireless network asset intelligence

- Some remote areas may best be served by wireless connections
- Identify existing infrastructure
- Import data into your existing GIS platform
- 3x the assets in the FCC's ASR (Antenna Structure Registration)
- Overlay with other data such as fiber routes and demographics

The screenshot displays the TowerSource web application interface. At the top, there is a navigation bar with the TowerSource logo, a search bar, and links for 'Map', 'Submit Asset', 'Learn', 'Support', 'Upgrade', and 'Sign out'. Below the navigation bar, the main content area is divided into two sections. On the left, there is a sidebar with a search bar containing 'Denver, CO, USA' and a 'List Results' button. Below this, there are icons for 'Favorite', 'Edit', 'Add photo', and 'Share'. A 'Street view' button is also present. The main section on the right is titled 'Asset Details' and contains a table with the following information:

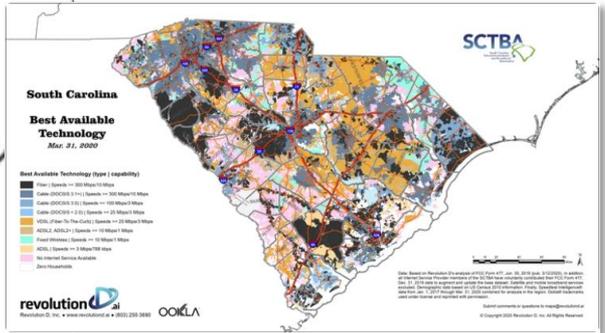
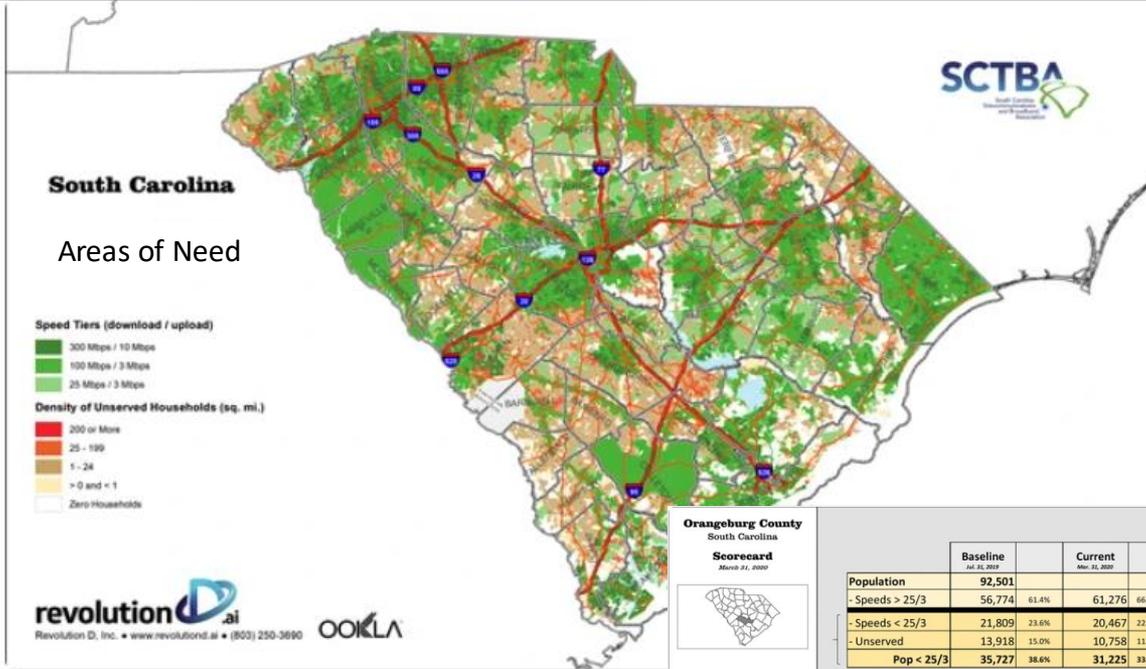
Asset Details	
Operator Name	SBA
Type	Tower
Status	Active
Operator Site ID	CO40860-T
ASR Number	1266980
FAA Study Number	2008-ANM-3328-OE
Description	Monopole
AGL	60.04 ft (18.3 m)
AMSL	5983.85 ft (1823.9 m)
Ground Elevation	5923.81 ft (1805.6 m)
Address	Lakewood, CO 80228 United States
Latitude	39.71170 (39°42'42.12"N)
Longitude	-105.14726 (105°8'50.14"W)
Construction Date	10/31/2008

The right side of the interface shows a map of Denver, CO, USA, with various tower locations marked by icons. The map is overlaid with a network of red and green lines, likely representing fiber routes or service areas. The map includes labels for various neighborhoods and streets, such as 'West Pleasant View', 'East Pleasant View', 'Mesa View Estates', 'Sixth Avenue West', 'Green Mountain Townhomes', 'Briarwood', 'Alameda Homes', 'Quailridge Townhomes', 'Ashwood', 'Danelis', 'Mountain Crest', and 'Cedar Crest'. The map also shows the '6th Ave Freeway' and 'St. Anthony's Hospital'.



SOUTH CAROLINA DIGITAL DRIVE

scdigitaldrive.com



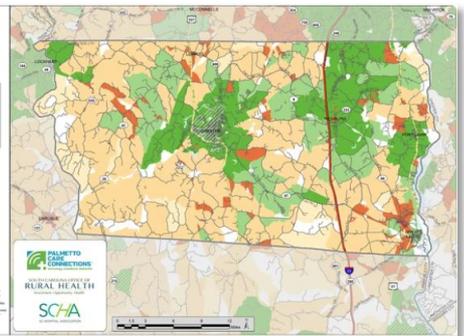
Best Technology Available

Orangeburg County
South Carolina
Scorecard
March 31, 2020

	Baseline Jul. 31, 2019		Current Mar. 31, 2020	Proj. Dec.
Population	92,501			
- Speeds > 25/3	56,774	61.4%	61,276	66.2%
- Speeds < 25/3	21,809	23.6%	20,467	22.1%
- Unserved	13,918	15.0%	10,758	11.8%
Pop < 25/3	35,727	38.6%	31,225	33.8%
Households	42,504			
- Speeds > 25/3	25,228	59.4%	27,159	63.9%
- Speeds < 25/3	10,723	25.2%	10,040	23.6%
- Unserved	6,553	15.4%	5,305	12.5%
HH < 25/3	17,276	40.6%	15,345	36.1%

*Funding Commitment: USDA ReConnect Rural 1 (Orangeburg County Broadband) \$4.75M, Oct. 22, 2019; Impact 3.0M residents and 1,812 households.

Chester County
South Carolina
Areas of Need
July 31, 2019



County Broadband Atlas

County-by-County
Scorecard



West Virginia Announces “Most Accurate Broadband Map to Date”

The Herald-Dispatch
herald-dispatch.com
HUNTINGTON, WV

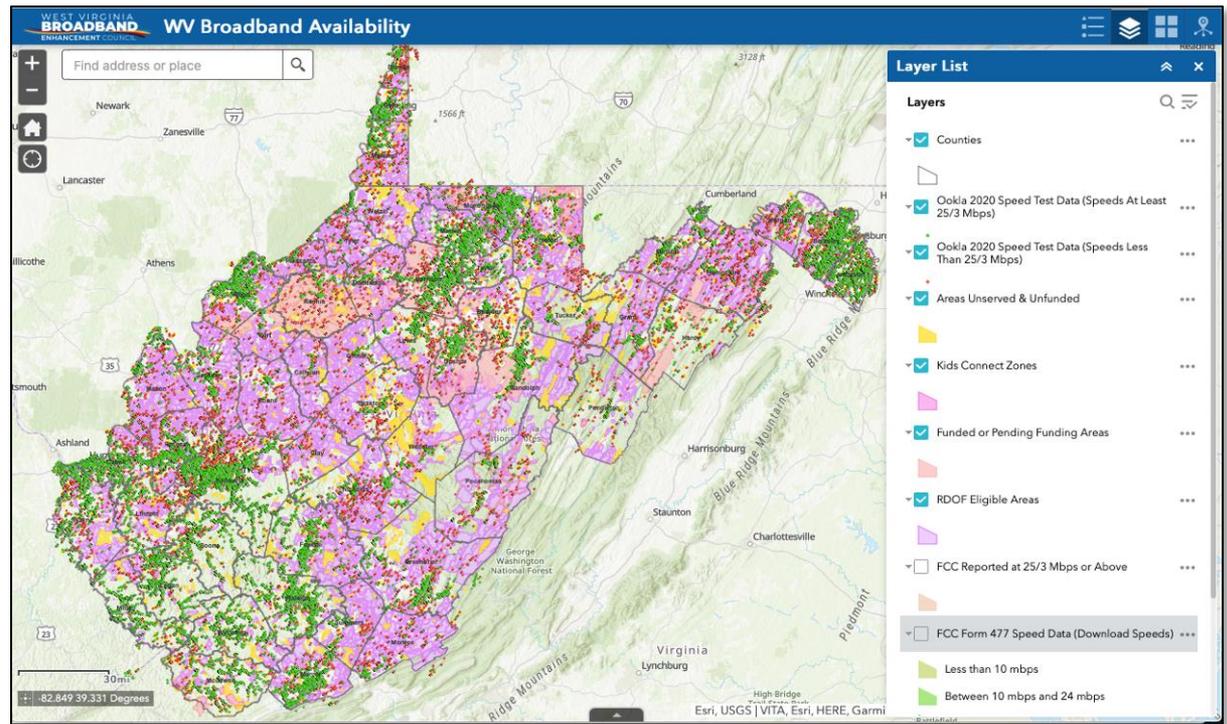
Excerpt – Nov 30, 2020

“Previous broadband availability maps — such as those provided by the FCC — relied on information from carriers and used the speeds they were advertising in an area, not the speeds actually received by consumers

Our first-of-its-kind map instead uses actual speed data from consumers, and the result is now the most accurate, detailed map of where broadband is and is not in the state of West Virginia.”

— Delegate Daniel Linville

The map was completed recently with financial support from the National Telecommunications and Information Administration, the West Virginia Department of Commerce and state Development Office’s Office of Broadband. Thanks to a grant, the state partnered with Ookla, the developers of www.speedtest.net



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- Download individual results
- Link to your own broadband survey
- Use survey to capture reports from no-service areas

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The screenshot displays the 'WEST VIRGINIA INTERNET SPEED TEST' interface. At the top, the 'WEST VIRGINIA BROADBAND ENHANCEMENT COUNCIL' logo is visible alongside navigation links for 'ABOUT' and 'NEWS CENTER', and a red 'TAKE THE SPEED TEST' button. Below the header, a dark blue banner reads 'WEST VIRGINIA INTERNET SPEED TEST'. The main content area features a 'Take the Speed Test' section with a large 'GO' button inside a circular frame. Below this, two server location options are listed: 'WVNET Morgantown, WV' (selected) and 'West Virginia Broadband Enhancement Council Charleston, WV'. Navigation icons for back, forward, and search are present. Below the speed test section is a 'Take the Survey' section with a blue header 'West Virginia Internet Use Survey'. The survey introduction text reads: 'Welcome to the West Virginia Internet Use Survey! The West Virginia Broadband Enhancement Council wants to better understand what types of internet services homes and businesses have available and subscribe to in the state. We also want to understand the ways in which internet services are used by West Virginians. We would like you to tell us about internet service availability and use at a specific "Location." This Location can be your home, business, or workplace. It may or may not be the place where you are right now, completing this survey.' A 'Next' button and a progress indicator showing 'Page 1 of 4' are at the bottom. The footer text is 'Powered by Survey123 for ArcGIS'.

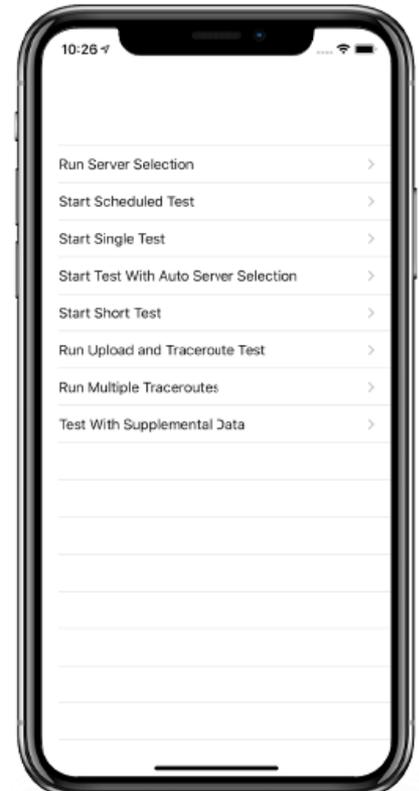
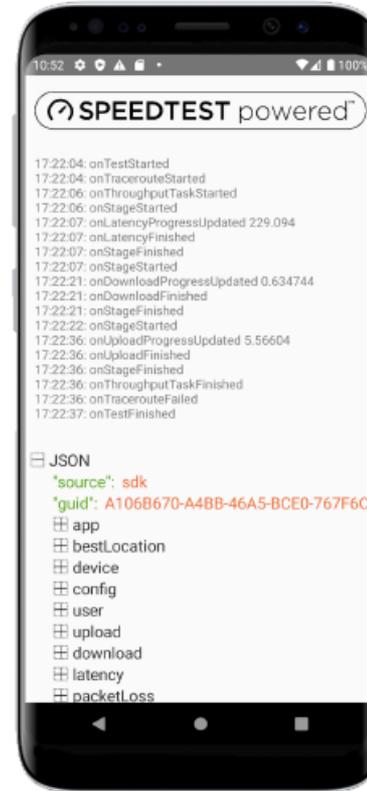
Distance Learning & the Digital Divide

Speedtest Powered — Mobile SDK

- Even before COVID, the digital divide created a homework gap for students lacking internet connectivity
- Trigger Speedtest measurements programmatically on Android & iOS
- Prepare for what's ahead and collect data while respecting privacy and security laws



Major School District Trial Underway



Using Data as a Foundation for Broadband Planning

Thank You!

Bryan Darr

Vice President, Smart Communities
Ookla

Bryan.Darr@Ookla.com



Data as the Foundation for Broadband Planning

Questions and Comments

- Please type your questions in the Q&A box.
- The slides, transcript, and a recording will be posted on the BroadbandUSA website within 7 days of the webinar.

<https://broadbandusa.ntia.doc.gov/past-event>

Broadband USA

Tune in for the next
Practical Conversations Webinar

**NTIA Grants Program in the
Consolidated Appropriations Act of 2021
March 17, 2020
2:00 pm EST**

Registration is required for each webinar:

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Broadband TA Request Form -

<https://broadbandusa.ntia.doc.gov/ntia-common-content/how-we-can-help>

BBUSA Resources

- [Implementing a Broadband Network Vision: A Toolkit for Local and Tribal Governments](#)
- [Community Broadband Roadmap Toolkit](#)
- [Guide to Federal Funding of Broadband Projects](#)
- [Using Partnerships to Power Smart Cities](#)